FORECASTING INDIANA COAL PRODUCTION

& The Midwest Coal Fuel Alliance

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Indiana Historic Coal Production Data

QUESTION:
Where are we going from here?
Three Possible Forecast Methods

(1) **Business as usual** – use historic growth rates

(2) **Shift-share**

\[ CPi = \frac{CPi}{IBCPI} \times \frac{IBCPI}{USCPi} \times \frac{USCPi}{USenergyi} \times \frac{USenergyi}{USGDPi} \times USGDPi \]

(3) **Disaggregate approach**

Total Forecast Use

= Utility + Coke + Industrial Use

- best but not yet available, except utility
(1) Business as Usual

QUESTION:
What historical period to use?

1995-2004 ≈ 3.05% growth rate
1959-2004 ≈ 2.00% growth rate
(2) Shift-Share Method

\[
\text{% change } CP_i = \\
\left\{ \text{% change } \frac{CP_i}{IBC_{Pi}} \right\} + \left\{ \text{% change } \frac{IBC_{Pi}}{USC_{Pi}} \right\} + \left\{ \text{% change } \frac{USC_{Pi}}{US_{energy_{i}}} \right\} \\
+ \left\{ \text{% change } \frac{US_{energy_{i}}}{US_{GDP_{i}}} \right\} + \text{% change } US_{GDP_{i}}
\]

\begin{align*}
CP_i & \quad \text{Indiana Coal Production in year } i \\
IBC_{Pi} & \quad \text{Illinois Basin Coal Production in year } i \\
USC_{Pi} & \quad \text{United States Coal Production in year } i \\
US_{energy_{i}} & \quad \text{United States Energy Use in year } i \\
US_{GDP_{i}} & \quad \text{United State Gross Domestic Product in year } i
\end{align*}
(a) Change in Indiana’s Share of Illinois Basin

Factors controlling future change?
- Impact of Indiana legislation
- Changes in transport costs
- Changes in mining costs
(b) Illinois Basin’s Share of U.S. Coal Production

Factors controlling future change?
- Federal legislation regarding CO$_2$, other pollutants
- Increases in PRB transport costs
- Success of Coal Fuels Alliance (CFA)

AVERAGE ANNUAL DECLINE 3.0% 1995-2004
U.S. Coal’s Share of U.S. Energy Use

Factors controlling future change?
- World oil/gas prices
- Federal clean coal initiatives
- CO₂ legislation

Average annual decline:
- 0.3%
- 1995-2004
(d) Energy’s Share of U.S. GDP

Factors controlling future change?

- World energy prices
- Success of government programs to conserve energy

(e) U.S. GDP growth 3.7%, 1995-2004
A Forecast of Growth

Assuming:

**IF**
- Indiana share grows at historical rate of 5.9%/year
- Illinois Basin share declines at historical rate of 3.0%/yr
- U.S. coal’s share grows at EIA forecast of 0.5%/yr
- U.S. energy’s share declines at EIA forecast rate of 1.8%/yr
- U.S. GDP grows at CEA forecast rate of 3.1%/yr

**THEN**

\[5.9\% - 3.0\% + 0.5\% - 1.8\% + 3.1\% = 4.8\%\] forecast

Growth in the use of Indiana coal
Demonstration Indiana Coal Production Forecasts

Trajectory 1 – Base Case or “business as usual”
Trajectory 2 - Shift-share methodology
Beginning The Disaggregate Approach

PEMRG - Coal Use by Indiana’s Electric Sector

Assumes:
(1) Most/all increased coal supply comes from Indiana
(2) Includes Clifty Creek & all Rockport
Report on The Coal Fuel Alliance, CFA

- Three universities (Purdue University, Southern Illinois University, University of Kentucky) directed to stimulate use of Illinois Basin coals for production of transportation fuels (Fischer-Tropsch fuels)
- $85 Million authorized (Energy Act of 2005), $18.1 Million requested for FY 2007 appropriation
- Thrusts:
  1. Augment production facilities
  2. Develop next generation F-T fuels
  3. Develop next generation F-T using engines
  4. Environmental consequences of (3) and (4)
  5. Policy options to reduce risk of investment in F-T
  6. Construction of test facility
Drivers for F-T Fuels

- DOD wish for a single battlefield fuel
- National wish to “reduce our addiction to foreign oil”
- Wish for a sulfur free fuel

Competition between Eastern, Illinois Basin, and Western coals